

## PATENT CLAIMS

1. An electrical machine having
  - two laminated rotor cores (61, 62), which are arranged on a common shaft (1) at a predetermined axial distance and each have axially extending cooling channels (611, 621), and
  - two laminated stator cores (41, 42), which are associated with the laminated rotor cores (61, 62), characterized in that
  - the laminated stator cores (41, 42) likewise have axially extending cooling channels (411, 421), and
  - in each case one ring (5, 7) is arranged between the laminated rotor cores (61, 62) and the laminated stator cores (41, 42), each ring (5, 7) having radially extending flow channels, which are connected to the cooling channels of the respective laminated core.
2. The electrical machine as claimed in claim 1, the ring (5, 7) having radially extending webs (51, 52, 71, 72).
3. The electrical machine as claimed in claim 1 or 2, the two laminated rotor cores (61, 62) and the two laminated stator cores (41, 42) in each case being pressed against one another.
4. The electrical machine as claimed in one of claims 1 to 3, at least one of the laminated cores (41, 42, 61, 62) being chamfered at the point (410, 420, 610, 620) at which the coolant flow is deflected out of the axial extent into the radial extent.

5. An electrical machine having
  - a housing (2, 3),
  - a laminated stator core (43) and a laminated rotor core (63), which are arranged in the housing (2, 3) and of which at least one has axially extending cooling channels (431, 631), and
  - end winding areas at the end sides of the two laminated cores (43, 63), characterized in that
  - a cooling channel protrusion (81, 82) is arranged at at least one of the cooling channels (431, 631) in one of the end winding areas, it being possible with said cooling channel protrusion (81, 82) to deflect a coolant out of the housing (2, 3).
6. The electrical machine as claimed in claim 5, the cooling channel protrusions (81, 82) on the laminated stator core (43) being tubes, which are guided through a mounting plate (2) of the electrical machine.
7. The electrical machine as claimed in claim 5 or 6, the cooling channel protrusions on the laminated rotor core (63) being part of a rotor clamping ring (91, 92), into which flow channels (911) are incorporated.
8. The electrical machine as claimed in claim 7, the flow channels (911) in the rotor clamping ring (91, 92) guiding the coolant through the mounting plate (2), and a corresponding seal being arranged between the rotor clamping ring (91, 92) and the mounting plate (2).
9. The electrical machine as claimed in one of claims 5 to 8, two or more cooling channels (431, 631) being distributed in the circumferential direction in the laminated stator core (43) and/or laminated rotor core (63), every second cooling channel being connected to one of the cooling channel protrusions (81, 82) at one end side of the respective laminated core (43, 63), and the

other cooling channels being connected to cooling channel protrusions at the other end side of the respective laminated core.

10. A method for cooling an electrical machine having a housing (2, 3) having the following steps passing an axial flow of a coolant through at least one cooling channel (431, 631) of a laminated rotor core (63) and/or laminated stator core (43),  
characterized by
  - deflection of the coolant out of the at least one cooling channel (431, 631) by means of a cooling channel protrusion (81, 82) through an end winding area and out of the housing (2, 3).
11. The method as claimed in claim 10, the coolant flowing through cooling channels of the laminated rotor core (63) and/or of the laminated stator core (43) in the circumferential direction, alternately in opposite directions.